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(54) Fabric & Application

(57) There is described a non-woven fabric characterised in that at least a portion of the fabric comprises a region of protrusions from the surface of the fabric.

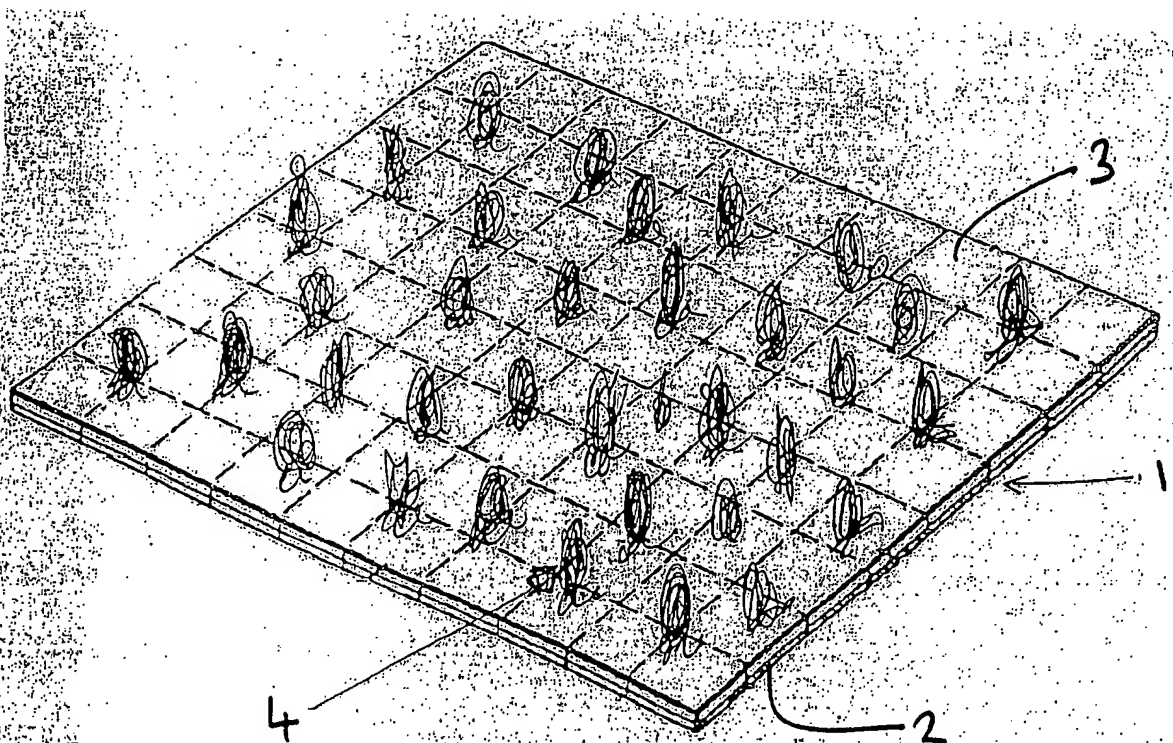


Figure 1

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Description

[0001] This invention relates to a novel form of non-woven fabric, to methods of preparation of such fabrics, to products comprising such fabrics and to the uses of such fabrics.

[0002] The epidermis is the outermost layer of the skin. It has long been known that the epidermis constantly renews itself by shedding old layers as new ones are formed. Therefore, the process of skin cleansing will generally include the removal of dead epidermal skin cells. This process, conventionally referred to as exfoliation, is the process by which, e.g. the skin, is washed or rubbed to remove dead skin cells.

[0003] The cleansing of the skin can be achieved utilising detergent solutions, but these have a tendency to cause pronounced drying of the skin without completely removing foreign matter.

[0004] There have also been proposed, to effect the exfoliation of the epidermis, compositions in the form of creams containing abrasive substances comprised of insoluble particles, in the appropriate size and shape, such as, for example, quartz particles, which, after application to the parts of the body to be cleansed, are removed by wiping or rinsing with water.

[0005] Such compositions are particularly effective but can cause some irritation. In addition, particles of the abrasive materials can remain in the pores of the skin and thus cannot be totally removed.

[0006] More recently, one has also advocated, for the cleansing of skin, especially oily skin, aqueous compositions in the form of creams, which contain abrasives in the form of mineral substances or sugars with low hydrosolubility in the cream, but which can dissolve during the cleansing of the skin with water.

[0007] US Patent No. 4,673,526 to L'Oreal describes, *inter alia*, skin cleansing compositions for deep skin cleansing. Such cleansing is achieved through an exfoliant action by the incorporation of abrasive particles within the composition. Although such compositions are reasonably effective, they require the use of, *inter alia*, polymeric materials and emulsifiers to stabilise the abrasive particles within the composition. Thus such compositions are generally expensive and/or require complex manufacturing processes. Furthermore, when such compositions are used, the polymeric abrasive materials may themselves be deposited on the skin and therefore following use of the exfoliant composition, a user must subsequently wash or otherwise clean the skin.

[0008] Thus there has long been a need for an exfoliant which is simple and inexpensive and either avoids the deposition of abrasive particles on the skin or is adapted to readily remove any such particles which are deposited.

[0009] We have now surprisingly found a novel form of fabric which overcomes or mitigates the aforementioned problems encountered with conventional methods of exfoliation.

[0010] Thus, according to the invention we provide a non-woven fabric characterised in that at least a portion of the fabric comprises a region of protrusions from a surface of the fabric.

5 [0011] The aforementioned protrusions may be ordered or disordered or a combination of ordered and disordered protrusions. However, preferentially, the region of protrusions comprises an ordered array of protrusions. To improve the exfoliating properties of such a fabric, it is especially preferred that the protrusions comprise are abrasive in nature. The abrasive nature of the protrusions may comprise a region of the protrusions, in which case it is preferred that the outermost, e.g. uppermost, surface of the protrusions possess abrasive properties. Alternatively, the whole of the protrusions may be abrasive.

10 [0012] In an especially preferred embodiment the non-woven fabric may comprise a substantially planar material, wherein at least one surface of the material substantially comprises an array of protrusions as hereinbefore described, such that it may be used as an exfoliating wipe. The protrusions described may be in the form of raised fibres substantially gathered in portions such that the coefficient of friction is greatly increased. 15 Alternatively, the fibres, if in thermoplastic form, may have been taken close to their melting points by various means such that the fibre will have coagulated / beaded in itself or in partnership with other fibres and have reshaped to form a rougher surface. This rougher surface provides for a greater drag force hence a higher coefficient of friction.

20 [0013] Thus, according to this aspect of the invention, we provide an exfoliating wipe comprising a substantially planar fabric as hereinbefore described.

25 [0014] The number and/or density of the protrusions may vary according to, *inter alia*, the nature of the material, the height of the protrusions and the desired abrasiveness to be achieved. Preferably, the protruded surface may comprise a protrusion density of from 500 to 10,000 per m². The protrusion density is defined as the number of raised regions per square metre, counted visually, particularly the number of raised regions on the surface of the fabric. The raised regions may simply comprise a small surface area, nap, fibre or bead.

30 [0015] Similarly the height of the protrusions may also vary and may be from 0.1 to 5 mm.

35 [0016] The fabric structures produced are characterised by a random fibre orientation in which fibres are arranged in three dimensions. The fabric weight may be in the range 20-1000 g/m² and the fabric density may be as low as 0.02 g/cm³. In the preferred embodiment the fabric weight of the non-woven is nominally 55 g/m².

40 [0017] In an especially preferred embodiment the fabric of the invention may comprise an abrasive surface and a smooth surface. This is especially desirable in a planar material which may comprise an abrasive surface as hereinbefore described and an opposing smooth surface. Thus, in use, such a material can be 45

used first as an exfoliating wipe and then be reversed to be used as a smoothing, cleansing and/or toning fabric.

[0018] In an especially preferred embodiment wherein one surface of the material substantially comprises an array of protrusions as hereinbefore described whilst the other side is substantially smooth. A measure can be taken of the coefficient of friction of the smooth side and the drag force is significantly less than the side used as an exfoliant. Thus, we especially provide an exfoliating wipe which comprises first and second surfaces and wherein the coefficient of friction of the first surface is significantly greater than that of the second surface.

[0019] Thus, the exfoliating wipes may be "two sided", that is, embossed on one side and smooth on the other. Therefore, in use, once the embossed, exfoliating side has been used, the other, smooth, cleansing and toning side can be used to enable the same action to be performed as a standard cleansing/toning wipe. These wipes have, therefore, a double action of exfoliating and cleansing or they may have a triple action of exfoliating, cleansing and toning.

[0020] We further provide the use of a fabric as hereinbefore described in the manufacture of an exfoliating wipe of the invention.

[0021] A variety of fibres may be used in the non-woven fabrics of the invention. A preferred fabric is one which is adapted to be thermally embossed. The fabric may be a one piece non-woven material or may be a blend of materials.

[0022] Examples of fibres which may be used in the non-woven fabrics of the invention include, but are not limited to, natural fibres such as pulp fibres, cotton, jute, wool and hair fibres etc., synthetic staple fibres, e.g. polyester, viscose rayon, nylon, polypropylene and the like, pulp fibres or mixtures of pulp fibres and staple fibres, aramid fibres, e.g. Kevlar®; and mixtures of any of the abovementioned.

[0023] An especially preferred material is a thermally bonded polypropylene/viscose rayon blend. Thus, in such a material the raised protrusions may be produced by high temperature embossing, for example, such that the polypropylene melting point is breached synthetic, low melting point fibres, are therefore preferred.

[0024] The length of the fibres used in the non-woven fabric of the invention may vary and may be those conventionally used in non-woven fabrics, e.g. from 1 to 50 mm. In addition, the non-woven fabric may comprise one or more binders, fillers, etc.

[0025] The fabric of the invention may also be coated or impregnated with cosmetically acceptable carriers or vehicles containing, for example, solvents, abrasives, moisturisers, humectants, oils, emulsifiers, thickeners, thinners, surface active agents, fragrances, preservatives, antioxidants, vitamins, minerals, colourants and preservatives. When the fabric comprises a planar wipe, one or both sides may be provided with one of the aforementioned materials.

[0026] When the fabric of the invention is provided with an abrasive substance, such substances may be selected from the following:

1. The xanthane gums, which are heteropolysaccharides of high molecular weight, greater than 1 million, notably the products known under the commercial names of KELTROL and KELTROL F by the KELCO Company, with respective average particle sizes 180 and 75 microns, as well as the product known under the commercial name of "RHODOPOL 23" sold by the Rhone-Poulenc Company, with an average particle size of 80 microns,

2. The carboxymethylamidons, notably the product sold under the commercial name of PERFECTAMYL CMA ZK N by the AVEBE Company, with an average particle size under about 125 microns,

3. The cellulose ethers such as ethylhydroxyethyl-cellulose, sold under the commercial name of "BERMOCOLL" by the BEROL CHIMIE Company, of which 95% of the particles have an average size under 500 microns,

4. The hydroxyalkylcelluloses such as hydroxyethylcellulose and hydroxypropylmethylcellulose, sold under the commercial name of CELLOSIZ by the UNION CARBIDE Company, and which have an average particle size of 70 microns, or under the commercial name of NATROSOL by the HERCULES Company and which have an average particle size of 50 microns, or under the commercial name of METHOCEL by the DOW CHEMICAL Company, including METHOCEL E50, with an average particle size greater than 50 microns.

5. The copolymers of acrylic acid and acrylamide with an average molecular weight between 9 and 12 million, notably the product sold under the commercial name of HERCOFLOC 1031 by the HERCULES Company, with an average particle size of 160 microns.

[0027] One or both sides of the substantially planar fabric of the invention may further comprise, singly or in combination, a skin exfoliant such as salicylic acid, lactic acid, or glycolic acid for enhancing turnover of epidermal cells. Other skin exfoliants include alpha-hydroxy and beta-hydroxy acids, and others which are known by those of ordinary skill in the art, e.g., fruit acids.

[0028] In a preferred embodiment, the wipe may comprise one or more of a vitamin A source including retinyl palmitate or other retinyl esters, retinoic acid, or Retinol; and Vitamin K. These components facilitate the skin cleansing and management of skin conditions. The Retinol facilitates normal skin production, particularly epi-

dermal normalisation. The Vitamin K inhibits or suppresses inflammation and bruising (i.e., acts as an anti-inflammatory and anti-bruising agent).

[0029] Anti-oxidants of both the enzymatic and non-enzymatic type may be included in the wipes of the invention. For example, superoxide dismutase (SOD), catalase, and glutathione peroxidase are natural enzymatic anti-oxidants used by the body. Suitable non-enzymatic anti-oxidants include such as Vitamin E (e.g., tocopherol), Vitamin C (ascorbic acid), carotenoids, Echinacoside and caffeoyl derivatives, oligomeric proanthocyanidins or proanthanols (e.g., grape seed extract), silymarin (e.g., milk thistle extract, Silybum marianum), ginkgo biloba, green tea polyphenols, and the like, and mixtures thereof. Carotenoids are powerful anti-oxidants, and they include beta-carotene, canthaxanthin, zeaxanthin, lycopene, lutein, crocetin, capsanthin, and the like. Preferably, the anti-oxidant component includes Vitamin E, Vitamin C, or a carotenoid. The anti-oxidant component, when used, is present in an amount sufficient to inhibit or reduce the effects of free-radicals.

[0030] It is yet a further feature of the invention that the non-woven fabrics may comprise a proportion of particles enmeshed within the fibres.

[0031] According to a further feature of the invention, we provide a process for the preparation of a non-woven fabric which comprises embossing, e.g. thermally, a non-woven fabric.

[0032] The web structure may be consolidated using thermal, mechanical or a combination of both bonding methods. Thermal bonding is obtained by mixing bicomponent or homogeneous thermoplastic fibres or particles with waste materials, typically in the proportion 5-50% (by weight of fibre) and then using either contact or through air bonding devices. Mechanical bonding can be applied using hydroentanglement. The use of a hydroentanglement system is preferred.

[0033] In use, to effect the cleansing and/or toning of the skin, notably of the facial skin, the wipe may be used in a massaging action, preferably in a circular manner. Thus a moderate abrasion is achieved, without irritation or the appearance of redness.

[0034] After massaging, the dead skin debris and other residue is removed by turning the wipe over to use the smooth side and/or, by a generous application of water, or other compositions.

[0035] The invention will now be illustrated by way of example only and with reference to the accompanying drawing, in which Figure 1 is a typical fabric formation process.

[0036] Referring to Figure 1, a non-woven fabric (1) comprises a substantially planar material with a first surface (2) and a second surface (3). The first surface (2) is smooth whilst the second surface (3) is embossed so as to provide a plurality of protrusions (4).

Claims

1. A non-woven fabric **characterised in that** at least a portion of the fabric comprises a region of protrusions from the surface of the fabric.
2. A non-woven fabric according to claim 1 **characterised in that** the protrusions are ordered.
3. A non-woven fabric according to claim 1 **characterised in that** the protrusions are disordered.
4. A non-woven fabric according to claim 1 **characterised in that** the protrusions have an increased coefficient of friction.
5. A non-woven fabric according to claim 1 **characterised in that** the protrusions are abrasive in nature.
6. A non-woven fabric according to claim 5 **characterised in that** the outermost surface of the protrusions possess abrasive properties.
7. A non-woven fabric according to claim 5 **characterised in that** the whole of the protrusions are abrasive.
8. A non-woven fabric according to claim 1 **characterised in that** the non-woven fabric comprises a substantially planar material, wherein at least one surface of the material substantially comprises an array of protrusions.
9. An exfoliating wipe comprising a substantially planar fabric according to claim 8.
10. A non-woven fabric according to claim 1 **characterised in that** the number and/or density of the protrusions varies according to the desired abrasiveness to be achieved.
11. A non-woven fabric according to claim 1 **characterised in that** the protruded surface comprises a protrusion density is from 500 to 10,000 per m².
12. A non-woven fabric according to claim 1 **characterised in that** height of the protrusions is from 0.1 to 5 mm.
13. A non-woven fabric according to claim 8 **characterised in that** the planar material comprises first and second regions wherein the first region has a significantly higher coefficient of friction than the second region.
14. A non-woven fabric according to claim 8 **characterised in that** the planar material comprises an abrasive region and an opposing smooth region.

15. A non-woven fabric according to claim 11 **characterised in that** the fabric comprises an abrasive surface and a smooth surface.
16. A non-woven fabric according to claim 15 **characterised in that** the planar material comprises an abrasive surface and an opposing smooth surface. 5
17. A non-woven fabric according to claim 1 **characterised in that** one surface of the material substantially comprises an array of protrusions whilst the other side is substantially smooth. 10
18. An exfoliating wipe comprising a substantially planar fabric according to claim 17. 15
19. An exfoliating wipe according to claim 18 **characterised in that** the wipe is also adapted to perform as a cleansing wipe. 20
20. An exfoliating wipe according to claims 18 or 19 **characterised in that** it is also adapted to perform as a toning wipe.
21. A non-woven fabric according to claim 1 **characterised in that** the fabric is one which is adapted to be thermally disturbed. 25
22. A non-woven fabric according to claim 21 **characterised in that** the thermal disturbance comprises embossing. 30
23. A non-woven fabric according to claim 21 **characterised in that** the abrasive protrusions comprise coagulations or beads. 35
24. A non-woven fabric according to claim 1 **characterised in that** the abrasive protrusions comprise raised/gathered fibres. 40
25. A non-woven fabric according to claim 1 **characterised in that** the fabric may be a one piece non-woven material or may be a blend of materials.
26. A non-woven fabric according to claim 1 **characterised in that** the non-woven fabric is selected from natural fibres such as pulp fibres, cotton, jute, wool and hair fibres etc., synthetic staple fibres, e.g. polyester, viscose rayon, nylon, polypropylene and the like, pulp fibres or mixtures of pulp fibres and staple fibres, aramid fibres, e.g. Kevlar®; and mixtures of any of the abovementioned. 45 50
27. A non-woven fabric according to claim 26 **characterised in that** material is a thermally bonded polypropylene/viscose rayon blend. 55
28. A non-woven fabric according to claim 1 **characterised in that** the length of the fibres used are from 1 to 50 mm.
29. A non-woven fabric according to claim 1 **characterised in that** the fabric of the invention may also be coated or impregnated with a cosmetically acceptable carrier or vehicle containing one or more solvents, abrasives, moisturisers, humectants, oils, emulsifiers, thickeners, thinners, surface active agents, fragrances, preservatives, antioxidants, vitamins, minerals, colourants and preservatives.
30. A non-woven fabric according to claim 29 **characterised in that** the carrier is selected from one or more of a vitamin A source, a vitamin K source, Vitamin E (e.g., tocopherol), vitamin C (ascorbic acid).
31. A method of exfoliating and cleansing the skin which comprises the use of an exfoliant wipe according to claim 8 or 18.
32. We further provide the use of a fabric according to claim 1 in the manufacture of an exfoliating wipe according to claims 8 or 18.
33. A process for the preparation of a non-woven fabric according to claim 1, which comprises high temperature embossing, for example, such that the polypropylene melting point is breached synthetic.
34. A non-woven fabric or an exfoliating wipe substantially as described with reference to the accompanying examples and drawings.

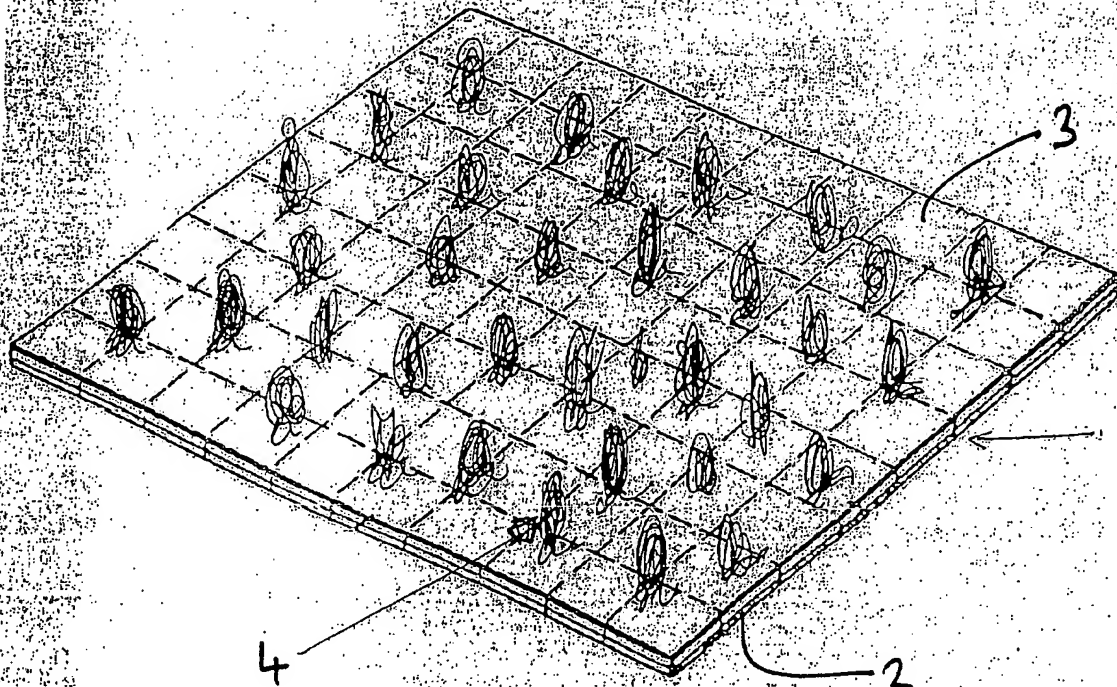


Figure 1



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EUROPEAN SEARCH REPORT

Application Number
EP 03 00 8121

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The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 3 July 2003	Examiner Demay, S
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

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